

GLOSSARY OF TEXTURAL TERMS FOR IGNEOUS ROCKS

CRYSTALLINITY (Relative proportions of glass to crystals)

- *Holocrystalline* - 100% crystals
- *Hypocrystalline* - mix of crystals and glass
- *Holohyaline* - 100% glass

MINERAL GRAIN SIZE (absolute diameter of granular crystals or length of elongate crystals)

- *Aphanitic*- crystals visible only with magnification (<~0.3 mm)
 - Microlites - very small crystals in glassy matrix visible only in thin section
- *Phaneritic* - crystals visible with naked eye; Specific size ranges:
 - Fine-grained* (<1 mm)
 - Medium-grained* (1-5 mm)
 - Coarse-grained* (5-30 mm)
 - Very coarse-grained* or *Pegmatitic* (>30 mm)

RELATIVE GRAIN SIZE (based on size relations of primary mineral phases)

- *Equigranular* - all primary minerals are similar size
- *Seriate* - range of grain sizes for most primary minerals
- *Hiattial* – bimodal distribution of grain sizes for most primary minerals
- *Porphyritic* - two distinct grain sizes of a particular mineral (qualify as weakly, moderately, or strongly porphyritic depending on abundance of large crystals). Also commonly termed "mineral"-*phyric* (e.g., plagioclase-phyric, olivine-pyroxene-phyric).
 - Phenocrysts - large crystals are comagmatic with groundmass
 - Xenocrysts - large crystals (commonly embayed) are unrelated to groundmass
 - Megacrysts - large crystals with no genetic connotation to groundmass
- *Glomeroporphyritic* - large crystals are clustered
- *Vitrophyric* - large crystals in a glass matrix

MINERAL GRAIN SHAPE (Habit)

- *Euhedral* - displays well-formed crystal faces and ideal crystal morphology

Shapes: <i>equant</i>	<i>rhombohedral</i> (acute-angled crystal faces)
<i>tabular</i> (or platy; L=W>H)	<i>bladed</i> (or lath-shaped; L>W>H)
<i>prismatic</i> (or columnar ; L>W=H)	<i>acicular</i> (or fibrous; L>>W=H)
- *Subhedral* - lacks crystal faces, but ideal crystal morphology is recognizable
- *Anhedral* - lacks all trace of ideal crystal morphology
- Special Shapes:
 - Embayed* - crystals bounded by curvilinear reentrants
 - Skeletal* - well-formed crystal contains graphic cavities
 - Dendritic* - groups of prismatic to acicular crystals oriented at right angles
 - Branching* (or spinifex) - groups of diverging prismatic to acicular crystals

RELATIVE GRAIN SHAPES (based on relative shapes of primary minerals)

- *Poikilitic* - strongly anhedral crystal (oikocryst) encloses multiple subhedral minerals of a different type (chadacrysts)
Ophitic – as above, but specific to pyroxene oikocrysts enclosing plagioclase chadacrysts
- *Subpoikilitic* – Anhedral crystal partially encloses other subhedral minerals
Subophitic, as above but specific to pyroxene partially enclosing plagioclase
- *Intergranular* - primary minerals form an interlocking framework of euhedral to subwherein individual anhedral crystals occupy interstitial spaces (common in plagioclase-bearing rocks)
- *Intersertal* - subhedral to euhedral crystals form an interlocking framework wherein glass occupies the interstices (common in volcanic rocks)
- *Pyroclastic* - composed of various type and sizes of volcanic rock and glass fragments (shards) and crystals in an aphanitic to glassy matrix

ORIENTED TEXTURES

- *Foliated* - subparallel alignment of medium to coarse-grained, elongate minerals in intrusive rocks
Development qualified as non-foliated, poorly, moderately, or well-foliated.
- *Trachytoid* - subparallel alignment of elongate minerals in volcanic rocks
Trachytic - subparallel alignment of fine-grained feldspar in volcanic rocks
Felty (or pilotaxitic) - random orientation of fine elongate crystals.
- *Radiate* - prismatic to acicular crystals emanate from a common nucleus;
Types: variolitic (fan) plume spray bow-tie
 sheaf-like spherical spherulitic (specific to volcanic rx)

INTERGROWTH TEXTURES (formed by simultaneous primary crystallization)

- *Consertal* - extensive interdigitation of adjacent crystals
- *Micrographic* - geometrically regular intergrowths of two phases on a microscopic scale;
Graphic - if visible with naked eye.
Granophyric - specific to quartz as micrographic intergrowths into alkali feldspar
Myrmekitic - specific to quartz as wormy intergrowths into plagioclase

OVERGROWTH TEXTURES (formed by sequential primary crystallization or peritectic reactions)

- *Corona* - late crystallizing phase partially to completely rims one or more crystals of another earlier-formed phase.
Rapakivi - Corona texture where Na-plagioclase forms rims on large alkali feldspar crystals
- *Reaction Rim* – replacement of primary phase by peritectic reaction with magma (e.g., O l+ magma → Opx)
- *Zoning* - Concentric gradations of solid-solution compositions in one mineral phase.
Attributes (recognizable by different extinction angles under cross-polarized light)
Continuity : smooth, stepped, or irregular changes in composition
Directionality: normal (low-T composition increases toward rim) or reverse
Cyclicity: single or multiple zoning cycles (oscillatory zoning)
Pattern: concentric, assymmetric, patchy, or sector

EXSOLUTION TEXTURES (formed by subsolidus unmixing of phases)

- *Symplectic* - intimate intergrowth of two phases where one has a very wormy form.
- *Lamellar* - narrow, parallel lamellae of one phase in a host phase
- *Oxide Exsolution* – very fine to med-grained tablets or needles of oxide (common in Pl & Pyx)
- *Epitaxial* – prismatic outgrowth from host phase into surrounding phases (e.g. biotite in Cpx)
- *Blebbly* - fine blebs or strings of blebs of one phase in a host phase
- *Perthitic* - very fine scale sinuous lamellae of sodium plagioclase in alkali feldspar host
- *Antiperthitic* - very fine scale lamellae or blebs of alkali feldspar in plagioclase feldspar

TWINNING

- *Primary* - crystallographic reorientation across twin planes during crystallization; types include:
 - Simple - one twin plane per crystal (e.g., Carlsbad twinning in feldspar)
 - Multiple (or polysynthetic) (e.g., Albite-twinning in plagioclase)
- *Secondary* - crystallographic reorientation induced by stress after crystallization (e.g., strain twinning in calcite)

BANDING TEXTURES (those recognizable in thin section)

- *Modal Layering*- defined by alternations of mineral abundances (modes); sub-types:
 - Isomodal - within layers, mineral modes are uniform
 - Graded - from a sharp modal interface, modes change gradually upsection
- *Textural Layering* -defined by alternations of mineral textures such as grain size, oikocryst density, and mineral habit
- *Flow Banding* - defined by semicontinuous alternations in the color, mode or texture of volcanic rocks. May be uniform, folded, or convoluted.
- *Amygdual Banding* - strings of elongate vesicles and amygdules in a volcanic rock.
- *Oxidation Lamination* - alternation of different states of oxidation (shown by color) in volcanic rock (common in basaltic andesites)

CAVITY TEXTURES

- *Vesiculated* - round, ovoid, or elongate holes (vesicles) formed by gas bubbles trapped in lava; *Scoriaceous* - strongly vesiculated rock
- *Amygdaloidal* - vesicular rock wherein vesicles are partially or totally occupied by late magmatic or post-magmatic minerals, such as quartz, calcite, zeolite, and chlorite.
- *Miarolitic* - Irregular cavity in plutonic rock; Crystals bounding cavity often show euhedral habits.